

TECHNOLOGY

DEVELOPMENT STRATEGIC PLAN

HARFORD COUNTY
MARYLAND
2002

CONTENTS

Background	4
Summary	5
Technology Development Opportunities	7
• Advanced & Engineered Materials	
• Advanced Manufacturing Technologies	
• Automotive Design & Testing	
• Information Technology	
• Materials Testing	
• Technical Services	
• Biotechnology Scale-up	
• Environmental Services	
Essential Support Ingredients	13
• Technology Generators	
• Professional Networks	
• Human Capital	
• Infrastructure	
• Technology Centers	
• Technology Cultures	
• Leadership and Community Support	
• Real Estate	
• Public Privacy	
Strategic Plan	17
• Institutional Framework	
• R&D Efforts	
• Support Structure	
• Image & Community Identity	
• Business Retention, Expansion, Attraction & Formation	
• Human Capital Development	
• Real Estate	
• Infrastructure	
Conclusion	23
Acknowledgments	24

BACKGROUND

“When compared to other areas of the country, Harford County offers the same ingredients essential for supporting and sustaining the growth of technology”

The Harford County Office of Economic Development commissioned Claggett Wolfe Associates to develop an assessment and strategic plan that would foster the growth of technology ventures in the County. Specifically, the consultant was asked to:

- Examine current conditions and marketing opportunities for clusters of technology activity in the County;
- Investigate whether there was a need for an expanded County incubator facility; and
- Develop a work plan that would serve as a roadmap for the Office of Economic Development to use in its efforts to expand the County’s technology community.

In order to ensure the long-term success of this effort, the Office of Economic Development, felt that it was essential for the mission and objectives of the Technology Development Strategic Plan to be consistent with Harford County’s broader economic development objectives.

To that end, the consultant conducted more than 80 interviews with educators, business leaders, Aberdeen Proving Ground personnel, community representatives, organizations, and leaders at both the local and regional level in order to assess current economic development objectives for the County and surrounding jurisdictions, and the policies of key players within both industry and government. The findings from these interviews were then analyzed, along with data such as number of patents, number and type of technology firms, geographic and demographic attributes, and existing resources, in order to develop an accurate assessment of Harford County as it currently exists and its potential for technology development.

Based on these findings, the consultant determined it was clear that developing programs to support a Technology Development Strategic Plan would conform to the County’s economic development objectives, but require increased allocation of resources.

SUMMARY

“Harford County is in the early stages of integrating commercial technology clusters within its economy.”

In its simplest form, the research undertaken by Claggett Wolfe Associates on behalf of Harford County, Maryland asks one basic question: “Is there an opportunity for Harford County to become a center for technology?”

The conclusion of their extensive research is a resounding “Yes.” Harford County is in the early stages of integrating commercial technology clusters within its economy. This transition is being driven by factors that are both unique to Harford County (such as the research and development opportunities at Aberdeen Proving Ground) and apparent throughout the Mid-Atlantic region (such as the growth of strong biotechnology clusters).

When compared to other areas of the country in which clusters of technology activity have developed and flourished, Harford County offers many of the same ingredients that are considered absolutely essential for supporting and sustaining the growth of technology ventures. What remains to be seen is how well the County is able to capitalize on the opportunity it currently has.

Harford County already possesses a solid base of established technology firms such as California Microwave, Northrop Grumman Information Technologies, Booz Allen Hamilton, Battelle’s new Eastern Regional Technology Center, Science Applications International Corporation (SAIC), and SURVICE Engineering Company. If the County follows the pattern established in other regions of the country where technology has flourished, this core group of technology companies can serve as the foundation as well as a magnet for future technology growth.

Harford County also has been successful in attracting new technology ventures such as Nutramax Laboratories, Smiths Detection, Sequel Design, and WebAd.vantage that serve to broaden and complement the region’s existing technology base. Again, similar patterns of business attraction typically are found in regions throughout the U.S. that have been successful in building clusters of technology activity.

Ultimately, Harford County possesses many of the attributes that are absolutely essential for a wide range of technology industries to flourish, from a sound infrastructure to strong leadership and community support. These support ingredients are in various stages of maturity requiring a continuing commitment to truly differentiate Harford County from other jurisdictions as a competitive location for technology growth.



SUMMARY

While the study team concluded that Harford County is not ready for a full-service incubator facility at this time, the team agrees that the County can employ defined strategies that focus on the technology development incubation process, rather than a physical facility to be built in the near term. The County can instead offer technology start-up companies access to professional support services, equipment, and specific expertise, provided either virtually or at the company's location.

Ultimately, the County's mission will be to continue to evolve from a production-based economy requiring land, tools, labor, and capital to a production - and service-oriented economy based on knowledge. In short, a "knowledge-based economy."

The question is whether a broad enough base of activity can be generated to support technology spin-offs or commercialization. If so, Harford County may be very well positioned to continue to grow and retain its own technology firms.

Harford County's Comparative Strengths

Comparative Advantages:

- Presence in the I-95 corridor central to the Baltimore-Wilmington-Philadelphia market
- Good accessibility via highways, Amtrak, MARC commuter rail and BWI Airport
- Specialized expertise and facilities at Aberdeen Proving Ground
- Future East Coast headquarters for Battelle
- Extensive waterfront
- Proximity to regional world-class educational institutions
- Higher Education and Applied Technology (HEAT) Center facilities and programs
- Unique appeal of Havre de Grace, a waterfront community
- Availability of modern industrial space and land at competitive prices
- Expanding base of regional distribution operations
- National reputation of Bulle Rock Golf Course and its future resort and conference center

Claggett Wolfe Associates

TECHNOLOGY DEVELOPMENT OPPORTUNITIES

Technology development opportunities in Harford County will be driven by both internal and external forces. External forces will come from corporate relocations or expansions within Central Maryland, as the resources and assets available in Harford County attract existing companies. Internally, Aberdeen Proving Ground (APG) is the County's largest technology generator and as such, appears most likely to help in the attraction of new technology tenants, the growth of service and supply networks, and even the spin-off of new technology ventures from ongoing research and mission expansion at APG labs. As a matter of national policy, the federal government supports dual use and commercialization of military technology.

Within the County, the commercialized value of research activity and the volume of small business creation has been evident, but has yet to meet its potential. As a result, opportunities seem most likely to originate from the service and supply relationships that have been established with APG and its attendant technology operations. Technology catalysts such as Battelle and SAIC also are expected to generate additional opportunities after their announced expansions are completed and their technology development capacities enhanced.

APG poses an interesting challenge for the County according to the consultant. This federal installation is a significant catalyst for military research and testing, which has important implications for the County. It is the anchor for much of the commercial technology which, in turn, may entice other technology companies to relocate, expand, or form in the County. This federal facility also has played a critical role in developing and maintaining much of the County's technology work force and could continue to do so in the future.





The challenge facing Harford County is to develop a structure that fosters a clear vision of the role APG can play in supporting technology development in the commercial sector.

APG and the County leadership have taken steps to make APG's many unique resources more readily available to the commercial sector. To maximize the business attraction, expansion, and creation opportunities inherent in APG, the focus should be on a short list of specific APG assets, such as the Aberdeen Test Center's Roadway Simulator, the Phillips Army Airfield, the Army Research Laboratory's Rodman Lab, biological and chemical labs, rapid prototyping capacity, and the biotechnology scale-up capacity in the Process Engineering Facility.

Opportunities from outside Harford County seem likely to be driven primarily by businesses that are looking to take advantage of the County as a lower cost alternative within the Central Maryland technology corridor, in which regional industry clusters in the biosciences, information technology, advanced manufacturing, and materials science have begun to flourish.

Harford County's geographic proximity to major U.S. markets, access to technology services (as well as the physical and intellectual assets of APG), affordable labor and housing, strong physical infrastructure, available greenfield development sites, and high quality of life are strong draws.

EIGHT TECHNOLOGY SECTORS

Based on the consultant's evaluation of opportunities, on-the-ground interviews, and a review of current industry trends, it was determined that eight technology industry sectors offer the best opportunity for clusters of technology activity to grow and develop in Harford County. They are as follows:

advanced and engineered materials

This sector covers the science of polymers, ceramics, and composite materials intended for use in the design, construction, and operation of structures, equipment, and systems. It also includes engineering, processing, and manufacturing practices as they relate to these materials.

Through APG, Cytac Fiberite, and others, Harford County possesses significant R&D and testing capabilities in this sector. It also supports manufacturing capacity through companies such as Huber Engineered Materials and Alcore. As a result, the County should encourage technology commercialization from APG and recruit commercial, growth-oriented businesses in this sector at all stages of development. Expansion plans by Battelle and SAIC may provide additional support to a business attraction strategy as companies in this sector seek to locate near these important service providers.

advanced manufacturing technologies

This sector involves new manufacturing techniques and machines, combined with the application of information technology, microelectronics, and new organizational practices within the manufacturing sector.

The County has numerous advanced manufacturing technology users, including the rapid prototyping, "physics of failure," advanced computer modeling, and reverse engineering capacity at APG, as well as precision metal manufacturing and plastics/rubber machining within the commercial sector. Opportunities here are likely to come from businesses that want to locate near clients or resources such as APG. Precision and custom machining may offer business formation opportunities as a support function to other technology sectors that develop in the County. Additional opportunities may exist to service the market for specialized equipment being driven by the biotechnology sectors in Montgomery County, Maryland, Philadelphia, or Northern New Jersey.

automotive design and testing

This sector involves three general stages following the initial research and development of a new automobile: the technology stage, in which the manufacturer's overall concept and design for a new automobile is developed; the prototype stage, where a test model of an automobile undergoes engineering, testing, and qualifications development; and the confirmation stage, in which

steps are taken to bring the newly created model into production.

APG's Aberdeen Test Center (ATC) handles prototyping (engineering, testing, and qualifications development) and confirmation (bringing newly created models into production) for both military and commercial applications. By assisting technology commercialization from APG and encouraging increased commercial utilization of APG vehicle test facilities, the County can create long-term growth opportunities in component design, manufacturing, and assembly.

information technology

This sector generally refers to the collection of products and services that turn data into useful, meaningful, and accessible information. The information technology (IT) industry's major facets include hardware, software, and services in the computer and telecommunications industries.

A core group of 140 IT companies has been established in the County based on quality-of-life considerations. In addition, APG research related to mobility platforms and wireless communications may create increased development opportunities in this field. As a result, development opportunities appear to exist in three key areas:

- attracting technology companies from regional competitors based on quality-of-life considerations; and
- developing back-office, technical support, and fulfillment opportunities related to IT to serve the County's concentration of distribution facilities; and
- spinning-off telecommunications-related opportunities from federal research conducted at APG. The County also should develop a service and support network for new venture formation and assist expansion of existing IT firms.

materials testing

This sector includes a wide range of technologies from strength, stress, torque, and hardness testers to sample preparation and material behavior underloading.

Although its capabilities are not widely known outside the military, APG can support an extensive array of product testing, from textiles to nanomaterials. Commercial applications within this sector may be expanded through enhanced relationships with organizations such as Underwriters Laboratories and the Center for Nondestructive Testing at Johns Hopkins University. The County should use this sector to support expansion of regional partnerships with Hopkins and the existing commercial sector.

technical services

This sector refers to the provision of technology-related expertise such as engineering, designing, drafting, technical writing and publication, as well as certain areas of computer programming, computer engineering, information systems integration, and quality testing.

Given the breadth of activity at APG, the technical services sector within the County is highly developed. In addition, the County is within close proximity to the pharmaceutical industry in New Jersey, the biomedical communities in Baltimore and Washington, the telecommunications cluster in Howard and Anne Arundel counties, and the software/E-commerce cluster in Northern Virginia. To take advantage of these resources, the County should support growth in this sector through the expansion of existing companies and the recruitment of complementary growth-oriented businesses. Development within this sector may lead to increased opportunities for attracting related industries, such as pharmaceuticals manufacturing or biotechnology R&D.

biotechnology scale-up

This sector includes the more advanced and technical biotechnology processes that involve modification and improvement, including fermentation, separation, purification, and product analysis.

Edgewood Chemical Biological Center's (ECBC) Process Engineering Facility at APG houses the capacity to produce both small batches and limited commercial runs of biologicals (cell-based manufacturing and processing of proteins, enzymes, antibodies, or other cellular products). The County, in cooperation with ECBC and commercial partners like Battelle, may be able to recruit growth-oriented biotechnology companies as they move from the R&D phase into scaling and production. Bioproduction may be an opportunity here in the County. Again, the County's location between the biotechnology and pharmacology hubs in Central New Jersey, Philadelphia, and Montgomery County, Maryland should be used to its benefit.

environmental services

While environmental services covers many fields, the service that is applicable within Harford County refers to research, development, design, and engineering of detectors and integrated systems for the measurement and detection of biological and chemical threats, as well as the functioning of mechanical, meteorological, and other physical systems. Increased concerns over homeland security, water management, and soil quality may offer opportunities for technology commercialization and licensing from various organizations at APG. The County – in cooperation with APG and commercial partners such as Smiths Detection, Sci-Tech, SAIC, Battelle, and Booz Allen Hamilton – could help to develop a viable technology cluster focused on sensor technology, environmental remediation, and homeland defense technologies. Expansion of existing businesses and recruitment of complementary environmental services companies would anchor development in this sector, while commercialization and spin-off opportunities from APG may provide venture creation opportunities.



Each of these eight technology industry sectors offers an opportunity for clusters of technology activity to grow and develop in Harford County. The market opportunities for developing these technology clusters will be driven by a number of additional factors, including research and development at APG, regional economic growth, and workforce development.

Given current industry conditions, the sectors discussed have yet to reach the level of business clusters. Technical services can be classified as a “developing” sector. While still relatively small, businesses in this sector are established and are, generally, in a critical growth/development phase.

The other seven technology industry sectors are best described as “new and emerging” in the Harford County economy. At this time, limited industry base exists for these sectors. Without the critical mass of an existing industry cluster, companies entering this economy generally must rely on outside sources of assistance or must possess an existing, developed service, supply, and marketing network.

Developing these industry clusters from such an early stage requires a high level of support, resourcing and program integration from both public and private sectors. Therefore, longer development horizons should be expected. Development of the underlining service and supply networks alone is a positive outcome, in addition to the ultimate success of the various new and emerging industry clusters.

Technology Cluster	Stage of Cluster Development in Maryland Region
Advanced Materials and Testing <ul style="list-style-type: none"> Advanced and Engineered Materials Advanced Manufacturing Automotive Design and Testing Materials Testing Technical and Engineering Services 	Nonexistent—Opportunity for development in Harford County based on concentration of assets.
Information Technology Cluster <ul style="list-style-type: none"> Information Technology 	Emerging—Regionally concentrated in Howard, Montgomery and Prince George's Counties, and Baltimore City with a small, but growing cluster in Harford County.
Biosciences <ul style="list-style-type: none"> Biotechnology Scale-Up 	Emerging to Mature—Regionally concentrated in Montgomery and Baltimore Counties, and Baltimore City, Harford County sector is led by APG- related research and assets.
Environmental Technology <ul style="list-style-type: none"> Environmental Services 	Nonexistent—Insufficient regional activity at this time for cluster information . Harford County supports a small concentration related to research and development at APG.

ESSENTIAL SUPPORT INGREDIENTS



Harford County possesses many of the attributes that are absolutely essential for a wide range of technology industries to flourish. These elements are in various stages of development. Several are yet to be sufficiently advanced at this time to differentiate Harford County from other jurisdictions as a competitive location for technology growth.

As the County expands its regional focus, it increasingly will have to develop a number of its technology attributes or rely on sources outside the County, at least in the short term, in order to sustain a truly supportive technology development environment. These resources include:

Technology Generators: Universities, federal laboratories, and corporate R&D laboratories serve as generators of commercial technologies. In Harford County, both the APG Science and Technology Board and the Higher Education and Applied Technology (HEAT) Center are bridging the gap between existing research and development activity and technology commercialization. The challenge facing the County is to develop a clear role for APG in participating with the local technology industry. To generate technology development, a concerted effort should be made toward promoting the unique assets offered by APG, including the Aberdeen Test Center's (ATC) Roadway Simulator, Army Research Laboratory's (ARL) Rodman Lab, Rapid Prototyping Facility, Phillips Army Airfield, and the biotechnology scale-up capacity in the Process Engineering Laboratory.

Professional Networks: The strength and diversity of regional resource networks play a critical role in providing support to a growing technology sector. Harford County possesses a very competitive market serving the debt needs of local businesses, as well as well-developed middle market and large market lenders servicing technology and manufacturing. The County's Small Business Development Center provides a mix of support services, counseling, and assistance in business plan preparation, while the Northeastern Maryland Technology Council (NMTTC) supports the needs of the technology community through periodic seminars, K-12 technology education programs and networking activities. The consultant has determined that local technology companies seek to establish an improved gateway to other technology companies, clients, and specialized resources in the region.

The County's proximity to Baltimore City and the Central Maryland technology corridor provides ready access to many professional networks to support technology businesses. Easy commute distances to downtown

Baltimore and Washington also make it relatively efficient for technology firms to access specialized legal and accounting services.

Human Capital: Human capital is a fundamental building block of any technology economy. Currently, the availability of technical workers in Harford County is relatively low when compared to the more populous jurisdictions in the region and those closer to Washington, D.C. This is due, in part, to the traditional composition of the workforce in the County. In addition, a high percentage of technical and professional workers who reside in Harford County currently commute to jobs in other jurisdictions. It is anticipated that as the employment base in the County evolves, it will attract more highly specialized and degreed employees from throughout the region. Growth of technology clusters will accelerate this shift.



The quality of secondary education is another key measure of human capital. Generally, Harford County schools rate high among competitors in peer counties, scoring seven percent (7%) higher than the state average on functional tests. The County also exceeds the

Maryland state average for attainment of high school equivalency, but lags in attainment of undergraduate and graduate degrees. To fill the gap, the County has expanded training and education programs, such as the Joppatowne High School Cisco Academy, Tech Prep, and the Aberdeen High School Math and Science Academy, and NMTC-sponsored student education efforts. The Office of Economic Development also is assisting employers with the cost of customized training to increase the skill level of employees.

Although strong technology communities generally develop around a four-year college or major research university, the experience of nearby Montgomery County, Maryland offers ample evidence that development of a flourishing technology sector can be accomplished without the full-time dedicated presence of a major university. Montgomery County was successful in building a highly regarded technology community because concerted efforts were made to forge strong relationships between area colleges/universities and local technology companies and to encourage university participation in satellite campuses such as Montgomery County's Shady Grove campus.

Following this model, Harford County should build upon the relationships that already exist among local businesses, APG, and the engineering programs at the University of Maryland and Drexel University. Stronger links with Johns Hopkins' Whiting School of Engineering, Towson University, the University of Phoenix, the Center for Non-Destructive Testing, and technical service providers may serve as a catalyst for developing new technologies and business development. The HEAT

Center could be positioned as a satellite campus for university-driven activities in much the same manner as Shady Grove.

Infrastructure: Harford County has a sound infrastructure system in place, featuring excellent ground transportation for personal vehicles and freight, easy access to international air transportation, and proximity to several seaports. Significant broadband telecommunications infrastructure is available along the I-95 and U.S. Route 40 corridors, although it is not fully accessible at this time. Affordable and reliable public water and sewer cover most of the commercial areas in the County's Development Envelope and Priority Funding Areas.

Technology Centers: Technology communities nationwide typically have an identifiable centering of business activity that supports the clustering of technology businesses. While Harford County has yet to establish an identifiable technology center, it has the potential to support the development of such locations in Havre de Grace and along the I-95 and U.S. Route 40 corridors, centering on the Water's Edge Corporate Campus. Recent developments within both of these proposed centers – including golf course expansion and development, improved stock of Class A office space, proposed conference center development, and mixed-use development plans – will serve as further incentives for establishing technology centers.

Technology Culture: Factors influencing the development of a technology culture in Harford County are in the early stages of development. The technology culture currently is dominated by APG. Moreover, the County does not have a track record of supporting technology start-up companies. Building the culture will come over time as the technology sectors become more established. The proposed Aberdeen High School Math and Science Academy, the Joppatowne High School Cisco Academy, the expansion of Battelle and SAIC, are all positive steps to improving the technology culture in the County. Also contributing to the development of that culture is the success of the quasi-incubator at the HEAT Center which to date has supported and graduated six technology businesses.

Leadership and Community Support: To be successful, a community and its leadership must be fully engaged in the process of technology development. In Harford County, community and industry stakeholders have demonstrated that they support formulating a long-term vision for creating a commercially based technology sector. Community and business leaders viewed the Harford County Technology Development Strategic Plan as a necessary road map for balancing growth, building and strengthening community infrastructure, guiding land use and economic development planning, supporting the development and integration of the educational system, and fostering closer relationships between APG and the commercial sector. They are now prepared to take the next steps.

Real Estate: Harford County possesses strong competitive advantages with respect to its real estate environment, including: its presence along the I-95 corridor, central to Philadelphia, Baltimore, and Washington; good accessibility; extensive waterfront; proximity to world-class educational institutions; the presence of APG, Battelle’s Eastern Regional Technology Center, and the HEAT Center; availability of modern industrial space and land at competitive prices; attractive residential environment; the unique waterfront appeal of Havre de Grace; an expanding base of regional distribution operations; and the national reputation of Bulle Rock Golf Course.

There are areas that must be improved. According to the consultant, the County lacks a recognized center of economic activity and a concentration of quality office space. Although growing, high-end housing within the proposed technology corridor is limited. In addition, the image of the County as a rural, blue-collar community persists.

Public Policy: Harford County excels in terms of public policy to support technology development. The County is undertaking a change in long-term economic development policy by transitioning its image as a hub for transportation, warehousing, and distribution into a reputation as a logical extension of Maryland’s high technology communities to the south. County economic development efforts are supported by programs such as the U.S. Route 40 redevelopment initiative, fast track permitting, and enterprise zone tax credits. Other County policy initiatives – such as the effort to implement the Aberdeen High School Math and Science Academy – demonstrate a cross-agency commitment to support economic development initiatives. The commitment to strategic thinking and planning are evidenced by resourcing this planning effort and focusing technology development within the broader development plans for Harford County.

“*Harford County
excels in terms of
public policy to
support technology.*”

S TRATEGIC PLAN

To position Harford County to take full advantage of the opportunity it has to become a center for technology growth and development, eight major initiatives and eighty-three specific actions have been identified. In summary, the consultant has recommended the following:

1. Institutional Framework

- a) ***Focus on Action:*** Technology-related development activities that have taken place over the past few years can serve as the foundation. The implementation of the proposed Harford County Technology Development Strategic Plan must be put into action.
- b) ***Create Geographic Focus for Technology Development:*** Technology development activities in Harford County should be concentrated in two specific areas – the Central Harford Technology District and the Havre de Grace Technology District – both within the Development Envelope and Priority Funding Areas. Planning and policy actions in these districts should focus on developing an environment that is appealing to technology companies and workers, with specific attention on creating ease of access, nearby residential developments, a pleasant office or campus environment, nearby places to eat and gather, after-hours entertainment activities, and easy access to business and professional support services that contribute to the overall quality of life for employees.
- c) ***Centralize Technology Development Activities:*** A central body consisting of business, technology, and government representatives reporting directly to the County Executive should be established to coordinate technology development activities. The function should be staffed through the Office of Economic Development, applying extensive technology industry experience.
- d) ***Engage Harford County into Central Maryland Technology Activities:*** While being careful to maintain its own identity, the County should become more involved in regional technology activities. Specifically, the County should secure more board representation on the Greater Baltimore Technology Council (GBTC), integrate efforts of the Northeastern Maryland Technology Council (NMTC) and the GBTC, and participate in regional and statewide technology activities.
- e) ***Develop Tools to Monitor Economic Performance:*** The County should develop a specific methodology or a matrix for collecting and analyzing information that will be useful for monitoring technology development activity. Specific information to be collected should include the number of technology businesses operating in the

County; the amount of R&D dollars flowing into the County; and the level of patent, Small Business Innovation Research (SBIR), and Small Business Technology Transfer Research Grant (STTR) activity.

2. Research and Development (R&D) Efforts

- a) ***Support Retention and Expansion of R&D Activities at APG:***
The County should provide continued public and private assistance for supporting the Army Alliance's efforts to retain, expand, and attract R&D commands at APG. The County also should closely monitor U.S. Department of Defense and related initiatives (such as the Quadrennial Defense Review and upcoming recommendations for military installation closures).
- b) ***Expand Relationships with Local and Regional R&D Centers:***
The proposed Technology Development Board should establish and sustain relationships with local and regional R&D centers, including APG, Johns Hopkins University, the University of Maryland, and Battelle. The Board should also expand relationships with A. James Clark School of Engineering at the University of Maryland, Johns Hopkins' Whiting School of Engineering, and others as needed.

3. Support Structure

- a) ***Create Technology Development Support Networks:*** The County should broaden its support network for technology ventures by establishing links to existing resources and service providers (financing sources, equity firms, etc.). This effort should include development of a Web-based information directory that addresses the needs of technology businesses and increased collaboration with the Greater Baltimore Technology Council (GBTC).
- b) ***Capitalize on Intellectual Assets and Resources:*** APG, Johns Hopkins University, Battelle, SAIC, and others have exceptional staff and facilities that may benefit the County's technology community. These organizations also serve as a breeding ground for new technologies that can be commercialized. To facilitate exchanges and dialogue, efforts must be taken to streamline the process of obtaining security clearances and APG access for private sector partners. Pilot programs aimed at testing new



processes and pricing strategies between private companies and APG may serve as the best mechanism for accomplishing this goal.

- c) ***Provide Business Education:*** The County should expand training to increase the benefits that can be derived from its local technology assets. Workshops to educate businesses on the Small Business Innovation Research (SBIR), and Small Business Technology Transfer Research (STTR) grant programs and the Cooperative Research Development Agreement (CRADA) program would provide a foundation for increasing collaboration among APG, area universities, and County technology businesses. Additional workshops on technology transfer and commercialization should be developed to encourage E-business creation and cross utilization of technology expertise among businesses.

4. Image and Community Identity

- a) ***Develop a Technology-Focused Community Image:*** The County must develop a communications strategy targeted to technology business owners, service providers, and investors from outside the County. The strategy also must focus on educating local residents, local government employees, and businesses about the benefits of technology development. First steps in that effort include updating the County website to feature technology as a business category and preparation of appropriate collateral materials.
- b) ***Support APG Technology Events:*** The County should capitalize on the success of the 2001 APG Technology Showcase by working with APG to promote expanded events and the County as a place for technology businesses. Harford County technology businesses that are not DOD focused should be included in the future.
- c) ***Enhance Appearance of Harford County's Technology Centers:*** The entrances leading into each Technology Center must project an image that conveys that the area is a home to technology firms. To that end, the County should investigate opportunities to establish additional ordinances that improve the appearances of district gateways and key corridors. The County should also investigate opportunities in the 2003 Master Plan Update and subsequent comprehensive rezoning to promote compatible land uses and commercial development within the proposed Technology Districts, while continuing U.S. Route 40 Corridor redevelopment efforts.

5. Real Estate

- a) ***Enhance Policies and Programs to Support Technology-Oriented Real Estate Development:*** The County should continue its fast track process, reviewing its procedures with developers and technology owners bi-annually in order to ensure that design review, permitting, inspection, etc. are adequately addressing technology-specific concerns. The County and municipalities also should review current zoning to improve land use patterns in each Technology District. The next Master Plan Update planned for 2003 and subsequent comprehensive rezoning would be an appropriate time to review this issue. This will allow the County to restrict incompatible uses, encourage mixed-use developments, address transportation issues, and create a sense of “place” that is important to technology businesses. Finally, the County should evaluate opportunities to increase developable parcels through land consolidation along U.S. Route 40 and other key corridors, and to apply redevelopment standards and incentives for business creation in each Technology District.
- b) ***Encourage Commercial and Residential Development Designed to Support Technology Districts:*** The County should continue to encourage developments such as Water’s Edge and expansion efforts, such as those of Battelle and SAIC. The County also must educate local developers on the special real estate needs of the technology sector, encouraging both mixed-use and residential development in close proximity to the Technology Districts.
- c) ***Support Technology Start-Up Real Estate Needs:*** The County should work with property owners and developers in the Master Plan and comprehensive zoning process to increase the inventory of small, flexible commercial space within the Technology Districts. For now, the nature of technology incubation may be more amenable to a distributed approach that depends on services being provided either virtually or at the start-up company’s location, as opposed to a dedicated incubator facility. Longer term, it may be advisable for the County to revisit the technology incubator concept as the level of technology activity accelerates.

6. Infrastructure

- a) ***Provide Sufficient Infrastructure to Support Technology Development:*** For each Technology District, the County should prepare a telecommunications infrastructure map and development plan; identify potential water and sewer needs (and work with appropriate agencies to develop plans and allocate funds to support growth); prepare a traffic study that examines

access, congestion mitigation, and signage; and identify potential power needs (working with BGE to develop plans and allocate funds to support growth).

7. Business Retention, Expansion, Attraction, and Formation

- a) ***Focus on the Technology Development and Incubation Processes:*** Rather than building a dedicated incubator facility, the County should focus in the short term on providing technology companies start-ups, as well as, high growth, mature companies with access to professional business support services. Evolving the process to meet growing demand for incubation services aligned with economic realities over the course of time is envisioned. These services can be provided virtually or at the innovator's location rather than at a central location. As the incubation process evolves, the County should regularly reexamine the limited scope incubator capability being successfully employed at the HEAT Center in order to assess whether market demand requires development of a centralized, full-service incubator. An evaluation of a facility should be coordinated in 5-8 years with periodic reviews.
- b) ***Assess and Support the Needs of Technology Businesses and Property Owners:*** The County must establish ongoing relationships in the business community in order to receive regular feedback and honest appraisal of the conditions for operating technology ventures. Regular surveys of all business and property owners should be conducted to statistically validate information gathered and to assess needs. The County should commit to developing appropriate programs, services, or linkages to meet or exceed the needs of technology businesses within five years.
- c) ***Assess Business Satisfaction:*** The County should conduct an annual postcard survey of technology businesses and property owners. The survey should contain 10-15 questions that focus on the respondents' level of satisfaction with doing business in Harford County. Survey results should then be used to enhance existing programs or to introduce new initiatives to support technology businesses.
- d) ***Attract New Technology Ventures:*** In addition to the technology communications strategy previously mentioned, the County should develop an industry ambassadors program, participate in regional technology trade shows to include APG Technology Showcase events, create relationships with site selection firms that focus on the technology sector, and initiate tours with regional real estate brokers.

- e) ***Create Technology Development Support Networks:*** Harford County should broaden its support for technology ventures by establishing links to existing resources and service providers. This should include development of a web-based information directory that addresses the needs of businesses in the specific technology industry sectors targeted for the County. To accomplish this, the County can utilize existing resources – including web sites and databases – such as those maintained by the State of Maryland, Greater Baltimore Technology Council (GBTC), and others. Membership and increased board participation in the GBTC also will bolster the County’s capacity to support technology ventures in each targeted industry. As the level of technology development activity in the County increases, support networks will help to lay the foundation for new venture formation through a business incubator or other program in the future.

8. Human Capital Development

- a) ***Develop Primary and Secondary Education Programs to Support Local Technology Development:*** With the Army Alliance, the County should advocate for federal funding to establish the Aberdeen High School Math and Science Academy. The County also should continue to support the Joppatowne High School Cisco Academy, while working with the public schools to develop life skills training and other technology supportive curricula in grades K-12. A task force to study best practices in technology education should be formed, and career opportunity tours among schools, local technology firms, and APG should be continued.
- b) ***Support Efforts to Provide Accredited Technology Focused Certificate, Undergraduate, and Graduate Programs:*** The County should continue to support efforts by the HEAT Center and others to provide technology focused graduate degree opportunities to Harford County residents. Existing technology-related programs with Johns Hopkins University, the University of Maryland, and Towson University should be sustained, where possible, and opportunities for establishing undergraduate technology degree matriculation agreements should be investigated. In addition, local programs must take steps to expand and improve specialized technology training programs. The annual business and property owner’s satisfaction survey should be used to measure the effectiveness of these programs.
- c) ***Provide Training Incentives:*** The County should educate local technology employers on existing training incentives and provide assistance to secure funding or credits from these programs.

C ONCLUSION

Technology industries can contribute significantly to the economy of Harford County as determined by Claggett Wolfe Associates. As a relative newcomer to commercial technology development, Harford County must establish its reputation as a competitive jurisdiction for the attraction, expansion, and formation of technology ventures.

In competing for technology development opportunities, Harford County is likely to face its greatest competition from nearby jurisdictions. Ironically, these same jurisdictions will provide Harford County with attraction, expansion, and development opportunities as technology pushes northward from Central Maryland. The combined strength of the region also will serve as a competitive force nationally, enticing more technology businesses to investigate opportunities in Central Maryland and creating potential deal flow for all jurisdictions in the region.

The importance of technology firms in the local economy is significant. Technology development expands the base of higher paying jobs, increases tax revenue and supports balanced economic growth. Following the pattern of other Central Maryland jurisdictions with developing technology sectors, such as Montgomery and Howard Counties, Harford may expect to see positive economic returns over a short period of time by implementing the “Technology Development Strategic Plan” including:

- Rapid growth in employment base
- Significant increases in technology sector wages
- Growth in complementary industry sectors such as professional services, manufacturing, and warehousing
- Diversification of the industry base
- Enhanced quality of life

The collective impact of these changes will positively impact local businesses, the resident work force, and County government alike by creating an environment for sustainable, long-term economic gains.

According to the consultant, development of technology industry sectors in Harford County could result in substantial economic gains in terms of economic output and job creation. It is clear that by properly positioning itself, Harford County can substantially increase its chances to become a center for technology growth. The challenge is in determining which activities are most likely to stimulate the formation and growth of technology ventures, while simultaneously maintaining a healthy environment in which to live and work.

Ultimately, the County must opt to pursue those strategic actions that will have the greatest impact on enhancing technology development in harmony with local and regional management issues. Doing so will enable Harford County to create the most sustainable ripple in the County-wide economy, now and into the future. Creating this Strategic Plan is the first step in wisely planning and allocating resources to meet the County’s goals.

A CKNOWLEDGEMENTS

The Plan represents the contributions of private sector, federal, state, and local government, community members, and paid consultants beginning in Fall 2001. The Harford County Economic Development Advisory Board's Technology Subcommittee guided the development of this Plan, with additional support from a Technical Advisory Committee comprised of other technology firm representatives and regional agency participants.

We also would like to gratefully acknowledge the financial contributions of those organizations who made development of the Harford County Technology Development Strategic Plan possible:

The Maryland Department of Business and Economic Development

The Maryland Technology Development Corporation (TEDCO)

Harford County Office of Economic Development

Battelle

Harford Community College

City of Aberdeen

Town of Bel Air

City of Havre de Grace

In addition to the grant contributors, special recognition and appreciation is extended to the Harford County Economic Development Advisory Board and the Technology Subcommittee:

Ms. Robin Lang, Chair, Economic Development Advisory Board

Dr. Richard Streett, Chair, Technology Subcommittee

Members of the Technology Subcommittee:

Mr. Joseph Brooks

Ms. Denise B. Carnaggio

Dr. James F. LaCalle

Ms. Mary M. Morris

Mr. C. Warren Mullins

Mr. Michael Parker

Mr. J. Thomas Sadowski

Consultant/Principal Authors:

Mr. Chuck Wolfe, Claggett Wolfe Associates

Mr. Phillip Gottwals, Claggett Wolfe Associates

Supporting Authors/Researchers:

Ms. Anita Morris, Bay Area Economics

Ms. Abigail Beyers, Bay Area Economics

Mr. Ben Hermosa, Claggett Wolfe Associates

Mr. Ray Weiss, Stanton Communications

H A R F O R D C O U N T Y

OFFICE OF ECONOMIC DEVELOPMENT

**220 SOUTH MAIN STREET
BEL AIR, MARYLAND 21014
410.638.3059/1.888.195.SITE**



**oed@co.ha.md.us
www.co.ha.md.us**